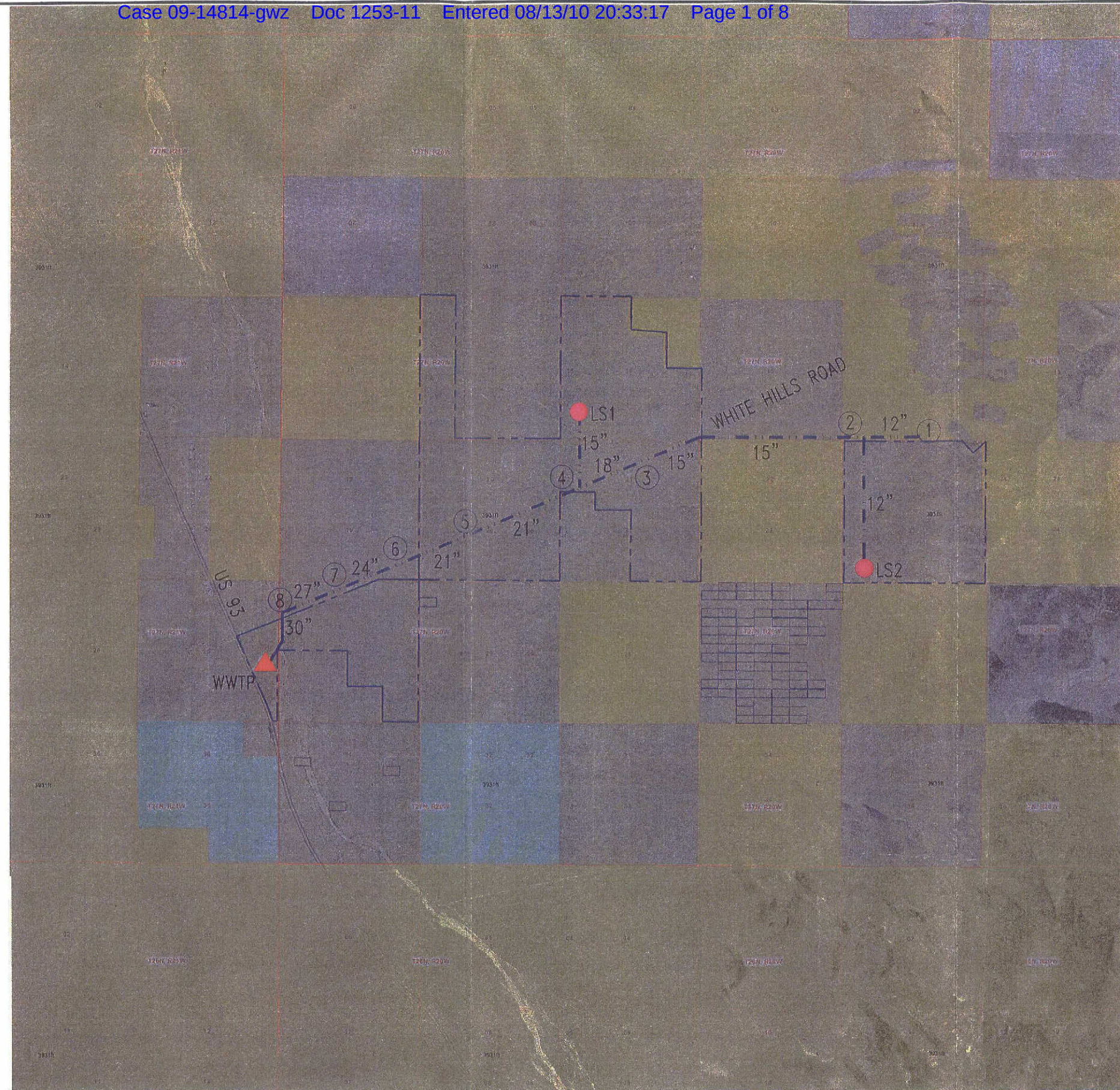
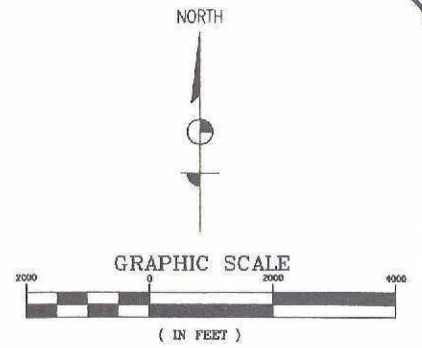


LEGEND:

- ① MAIN COLLECTION POINT
- LS1 POSSIBLE LIFT STATION LOCATION
- 18" SEWER MAIN AND SIZE
- ▲ WWTP TREATMENT PLANT LOCATION
- WHITE HILLS BOUNDARY



Traffic Infrastructure

CL01010

## Section 6

### Traffic Infrastructure

#### **PROJECT BACKGROUND – EXISTING CONDITIONS**

Access to the White Hills area is provided via US Highway 93 and White Hills Road, also known as Mohave County Highway 145. While US Highway 93 is an all weather road, White Hills Road is subject to flooding at the Detrital Wash, where weir flow occurs when the capacity of six barrel pipe culverts is exceeded.

See Figure 6-1 for roadways and constraints. All Rhodes White Hills parcels are north and east of US Highway 93, and are generally contiguous on either side of White Hills Road. The parcels lie completely within T27N, R20W sections 20 and 23, about 25% of section 17, about 80% of section 16, about 70% of section 21, about 60% of section 30, and about 15% of T27N, R21W section 25. Although White Hills Road is paved throughout the project limits, it is subject to flooding during severe storm events. Unpaved roadways (dirt) exist to serve existing developed and occupied parcels.

US Highway 93 is a four lane, access controlled, divided highway with right of way abutting the nearest project property within the project vicinity. US Highway 93 is a four lane divided facility except for the first approximately ten to twelve miles from Hoover Dam on the Arizona side of the Colorado River.

White Hills Road is a two lane unmarked (except near the US Highway 93 intersection) roadway lying within a 100-foot right of way.

**Figure 6-1 - White Hills Road looking towards Detrital Wash (northeast) from US Highway 93.**



White Hills Road is utilized by residents of the White Hills area and a commercial gravel operation, northeast of the project parcels.

The intersection of US Highway 93 at White Hills Road presently operates at level of service "C" during 30<sup>th</sup> hour demand and can accommodate the development of about another 200 homes before intersection improvements must be considered. Under the existing intersection geometry, the addition of a traffic signal on US Highway 93 at White Hills Road will accommodate the existing traffic plus future traffic generated by another 2,600 homes, without any additional intersection improvements. Please note that advance warning flashers will, in all likelihood, also be required because of the change in traffic control devices, and because traffic signal at this location will violate drivers expectations.

## **PLANNED IMPROVEMENTS – GOVERNMENT ENTITIES**

Review of the Mohave County, Arizona Department of Transportation (ADOT), and Western Area Council of Governments (WACOG) websites revealed no planned projects for roadway improvements that would impact this project. One project currently under construction is the new Hoover Dam Bypass Project being worked on both sides of the Colorado River. The bridge project is under construction on the Arizona side while the roadway work project preceding the bridge project is under construction on the Nevada side. When completed, this project has the potential to have significant impacts on this project.

## **TRIP GENERATION AND PROJECT IMPACTS**

The keys to the success of this project are either providing access to US Highway 93 or internal capture of the project generated traffic. This project will develop approximately six sections of land for residential use. For single family detached dwelling units, peak hour trips occur between 7:00 and 9:00 am and 4:00 and 6:00 pm, which also correspond with commercial and industrial peak hour trips. A single section of land developed at a density of four units per acre, will generate approximately 20,536 trips per day, with 1,351 outbound and 450 inbound am peak hour trips and 1,250 inbound and 734 outbound pm peak hour trips. At this rate, it is clear that development of less than 100 acres will overwhelm the existing intersection of US Highway 93 at White Hills Road. Installation of a traffic signal on US Highway 93 at White Hills Road will provide enough capacity for development of 430 to 650 acres of land (depending on density) without expansion of the existing intersection; however additional capacity will be required on White Hills Road. Expanding the White Hills Road cross section to a four lane facility that will accommodate the traffic generated by the development of the first 1-½ sections of land.

The latest Average Annual Daily Trip (AADT) volumes available through ADOT are for the 2003 year. At that time, US Highway 93 was carrying a daily average of 8,900 vehicle trips between Hoover Dam and Pierce Ferry Road.

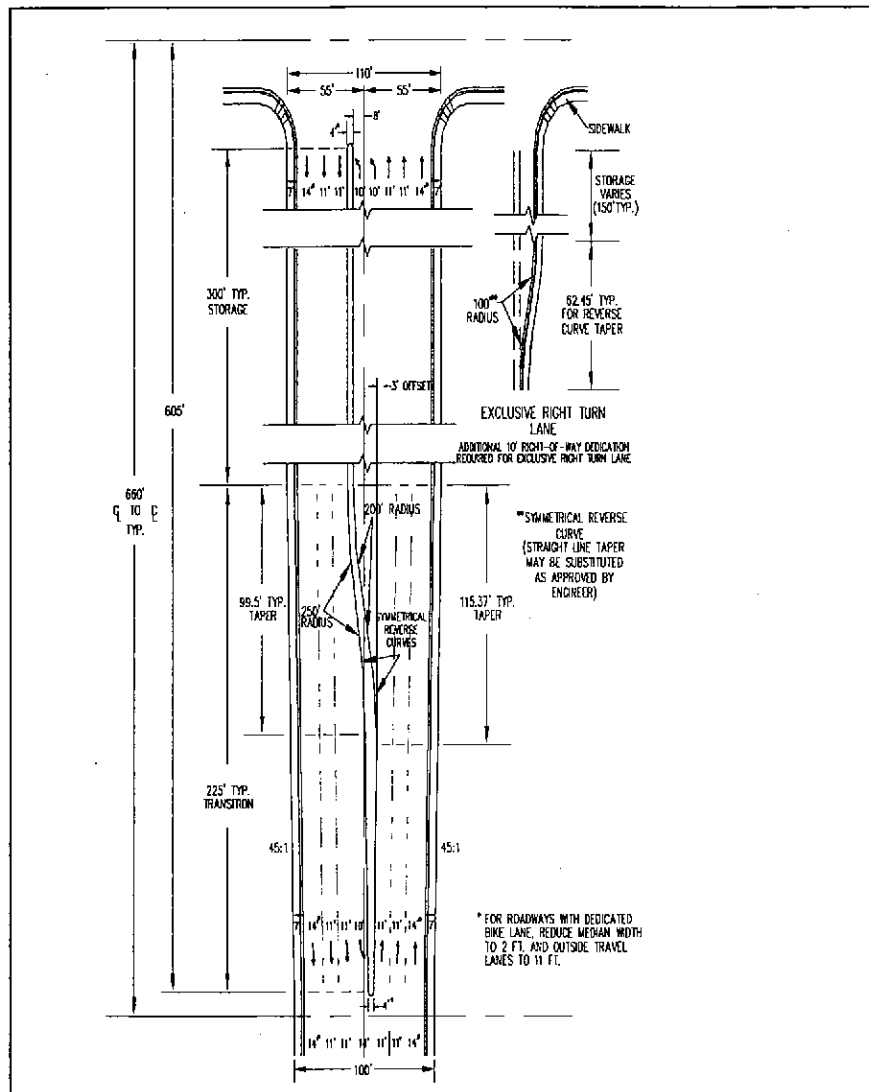
Under the existing plan, the property will be developed for residential use, removing internal capture as a factor in this development.

## **CIRCULATION ELEMENTS**

According to the Mohave County website, the roadway grid pattern paralleling the section lines has been continued throughout the (paper) subdivision of the project area. It is unlikely that White Hills Road will be realigned; therefore, each of the section line arterials should be realigned to intersect White Hills Road at right angles in order to increase intersection safety and capacity. Each of the section line roadways should be arterials with 100-foot rights of way. The intersections of all roadways with 100-foot or wider cross sections should be tapered (widened) to accommodate dual left turn lanes and dedicated right turn lanes as determined by development specific traffic study analysis.

Refer to Figure 6-3 below for proposed dual left and dedicated right turn lane schematic. The need for turn lanes will be determined by placement and density of land use types. The network of internal collector and local roadways can then be developed as necessary to provide access to all developments within the project limits.

**Figure 6-2 - Dedicated turn lane schematic.**



## DEVELOPMENT SCENARIOS

It is our understanding that this project will be initiated with construction of model homes, followed by phased subdivision construction to parallel sales. By the time the first section of land is fully constructed and occupied (at 6 units per acre), the development will generate 29,821 daily trips with 2,697 am peak hour trips and 2,858 pm peak hour trips. Compare six units per acre trip generation rates to four units per acre in section 4.3 above.

The capacity at White Hills Road and US Highway 93 at the intersection is key to this project. At intersecting major roadways, lane capacity is about 1,200 vehicles per hour per lane. White Hills Road crosses section lines at seven locations throughout the area purchased by Rhodes Homes. At build-out, White Hills Road will have a through capacity of 6,600 vehicles per hour (three lanes) in each direction. The controlling factor then becomes the intersection capacity of 3,600 vehicles per hour (three through lanes) in each direction. One solution is to extend Selrest Avenue (South section line of section 30) approximately 4,300-feet west and construct a new intersection on US Highway 93 at Selrest Avenue. Additionally, when the two intersections of US Highway 93 at White Hills Road and US Highway 93 at Selrest Avenue are at capacity, another roadway on the south edge of section 19 (Rocky Point Avenue) can be constructed (just over one mile) and another new signalized intersection can be constructed to relieve the congestion. Please note that review of the existing Assessors Parcel Maps show that the section lines in this area have half street dedications of 30 to 48 feet. This will need to be revised to 100-foot rights of way.

During the project development, the capacity of US Highway 93 will, at some point, be exceeded. According to Mohave County Staff, ADOT (as a reactive organization) will recognize the demand increase and will design and construct additional capacity to meet the increased demand on US Highway 93.

Evaluation of regional gravity model components shows that the City of Kingman and Boulder City/Las Vegas are major trip attractors for this area. This makes capacity of US Highway 93 intersections/interchanges critical. When these intersection capacity issues are resolved, the mainline capacity becomes critical.

### ESTIMATED COSTS

Table 6-1 below includes on-site transportation improvements inside the general boundaries of the project discussed in Section 4-5 of this report. This project has the potential to construct up to 12 major signalized intersections at an estimated cost of \$2.4 million in traffic signal costs, two new signalized intersections on US Highway 93 at an estimated cost of \$600,000 (may be constructed by ADOT) in traffic signal costs, will construct approximately 14 miles of arterial and Parkway facilities at an estimated cost of \$15.8 million, and interior roadways as required by the approved development scenario. Of course, the Land Use Plan which is finally adopted for this area will have significant impacts on the final configuration and cost of the traffic infrastructure. Capacity of the internal roadway network components will be determined by the location and density of trip generators (residential subdivisions).

**Table 6-1 - Estimated Costs in Thousands of Dollars**

Description	Unit	Quantity	Unit Cost	Total
White Hills Road Widening	Mile	4.2	\$1,200	\$5,040
Internal arterial roadways	Mile	9.8	\$1,000	\$9,800
Traffic Signal	Each	12	\$200	\$2,400
Total				\$17,240

## **MULTIMODAL CONSIDERATIONS**

In addition to the proposed and existing surface transportation systems, "Triangle Air Park" airport subdivision is also located in the project vicinity. The subdivision is constructed within the limits of two uncontrolled (and in all likelihood private) landing strips, the main landing strip runs north-south on the northeast side of US Highway 93, approximately one mile northwest of the White Hills Road at US Highway 93 intersection. The auxiliary air strip runs east-west on the north side of the subdivision, perpendicular to and intersecting the main landing strip at the north end. Both landing strips appear to be unpaved, unmarked, uncontrolled, and unlit.